POSEIDON
Analyzing the secrets of the Trident Node Monitoring Tool

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Poseidon - Leonardo Kuffo
Does it do the correct things?

How good is it?

**Efficiency** / Good Style

Memory Usage / CPU utilization

Intel® Performance Counter Monitor - A better way to measure CPU utilization
By Thomas Willhalm (Intel), Roman Dementiev (Intel), Patrick Fay (Intel)
Trident

Monitoring and Load characterization tool

Trident monitors the relevant *hardware and software* counters throughout the execution of an application at the *node level*, such that it does not induce significant overhead.

*Not limited only* to monitor CPU Usage or Memory utilization

Currently collecting *metrics* such as: Memory bandwidth, core utilization, active processor cycles, etc.
Is my application performing well?

+ TRIDENT

Counters Data
POSEIDON

(I hope you get why Poseidon... because I just got it yesterday)
POSEIDON
Transforming Trident Data into Knowledge

Objective
Provide understandable feedback to physicist and programmers in how their applications performs under different workloads.

Importance
If we understand what is happening, we can improve.
HOW POSEIDON WORKS

Trident Metrics of an application

WE KNOW YOU! (maybe)

Trident Metrics of Benchmarks

WE KNOW THEM!
We can attack our problem as a \textbf{Multi-variate Time series classification} problem.

The benchmarks are our \textit{classes}. At the end, the application workflow will be \textbf{matched} to benchmarks.
POSEIDON PIPELINE

Trident Metrics of Benchmarks

Train a classification model

WEASEL TRANSFORMATION

&

Support Vector Machine (SVM)
Let the model find the degree of similarity with each benchmark in the repository.

**Trident Metrics of an application**

**POSEIDON PIPELINE**

**BINARY SEGMENTATION**

96.36% of **accuracy** on evaluation data

Test and evaluate POSEIDON results on actual application workflows.

Poseidon can turn into a handy software tool for people who write code at CERN to **understand and improve** their code at a very low level in a quick fashion.
Thanks Everyone

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Project Progression Available Online:
https://docs.google.com/document/d/1VgfBxB82ljWcZ9l6kn0jBdWfP82tjlpb5ccVQclrIvE/edit?usp=sharing


